thetech.com



WEATHER, p. 2 FRI: 70°F | 50°F Sunny SAT: 74°F | 53°F

Volume 137, Number 28 Thursday, October 19, 2017

## Graduate students rally for **more on-campus housing**Students propose amendment to MIT's Volpe zoning

petition, demanding 1,800 grad housing units

**Sharon Chao** STAFF REPORTER

The student and community affiliate group Graduate Student Apartments Now held a rally in front of 77 Massachusetts Avenue and marched to Cambridge City Hall for an Ordinance Committee hearing Oct. 12 to demand that MIT build new graduate housing units as a condition of the commercial redevelopment of MIT's recently purchased Volpe parcel in Kendall Square.

In 2013, 38 percent of graduate students were housed on campus. The administration stated in an email to all graduate students on Oct. 16 that it will apply for permits to construct 700 more beds on campus, in addition to the 250 net beds currently being built as part of the Kendall Square redevelopment, by the end of 2020. The total addition of these 950 new beds will house more than 50 percent of the current graduate student population.

In an official statement on its website, GSAN wrote, "We com-

mend the administration for having the boldness to allocate real resources towards addressing the housing needs." However, it also pointed out that the "950-bed commitment falls somewhat short of the projected 1,000-1,100 shortfall in graduate housing" as determined by the interim report that the Graduate Student Working Group conducted

## The movement for more graduate student housing

GSAN began as a group of graduate students in the Urban Studies and Planning Department who met informally in the spring to discuss the redevelopment of the Volpe site, for which the MIT Investment Management Company had won a \$750 million bid from the federal government.

GSAN organizer Kelly Blynn SM '17 said in an interview with *The Tech* that GSAN was formed "to meet existing unmet demand for graduate student housing and to ensure that MIT is a good neighbor to its surrounding communities."

According to MIT's 2016 Town Gown report, 62 percent of MIT graduate students live off-campus. The 2016 Boston Comprehensive Housing Market Analysis estimated that students in Boston and Cambridge occupy 25 percent of the available rental housing stock. The 2016 Greater Boston Housing Report Card reported that average market rents rose 59 percent between 2009 and 2016 in Boston's inner core cities, which includes Cambridge.

In May, the graduate students submitted 300 signatures to the Volpe working group in support of more graduate housing. GSAN organizer Douglas McPherson MA '18 said in an interview with The Tech, "We felt it was quite clear that the commercial development at the Volpe site was going to bring a significant influx of new workers to Cambridge, adding to the already competitive rental housing environment."

The students received no response from the Volpe working

Housing, Page 12



MIT graduate students rally in front of 77 Massachusetts Ave. Oct. 12. calling for 1,800 new graduate apartments on campus as a part of the Graduate Students Apartments Now movement



Shovels engraved with "Kendall Square at MIT" were displayed with painted construction helmets before the groundbreaking of MIT's newest grad student dorm during the Kendall Square Innovation Playground at HUBweek Oct. 11. Despite this new dorm, grad students still feel there will not be enough on-campus housing for them.

## REPORTER'S NOTEBOOK

## Nightclub hosts tech startup showcase

Technology includes robotic marimba player and smart jewelry

By Meenakshi Sivapriya

Tech enthusiasts and nightclubs don't go well together. But that didn't stop GetGeeked from hosting its tech showcase at the Royale Nightclub in Boston on Oct. 13. Getting first-hand access to gadgets that haven't been released in the market yet and meeting fellow technology lovers, all while sipping on delicious cocktails, seemed like a perfect way to spend a Friday night.

Lenovo, the presenting sponsor, took center stage by providing demos of its Star Wars: Jedi Challenges experience on its newly developed Augmented Reality glasses, a standalone vision processing unit with a 40-degree field of view. Lenovo also gave away two Star Wars edition Yoga 910 2-in-1 convertible laptops as part of the raffle.

Another favourite of the energetic audience was Shimon the robotic marimba player. This fourarmed musician listens to the human player, then collaborates and improvises on the music notes. It claims to play chords that are "humanly impossible" to hit. It uses artificial intelligence and creativity algorithms to capitalize on the combined strength of itself and its human counterpart.

Airfox, a software company from Boston, built upon the theme of decentralization which cryptocurrencies use and created Airtokens, blockchain tokens that can be redeemed for mobile data. The startup, which makes profits from advertising revenue, aims at making mobile internet more accessible to anyone who owns a smartphone.

Invisawear, a smart jewelry company; Wooboo, an educative toy for kids (slightly creepy if you were to look at it when you're half-awake in the middle of the night); and Nightingale, a smart home sleeping system, all added to the menagerie of

iRobot had also turned up at the event showcasing its Roomba vacuum cleaner. Though the presentation mentioned HackMIT 2017's runner-up PlotRoomba, iRobot demonstrated how to use Roomba for what it was actually built for cleaning floors. Quite disappointing considering that I was first introduced to it through the cool hack of tracing out graphs of functions.

In a nutshell, for all the geeks out there who love a Friday night with free food and booze along with a chance to get their hands dirty with new and upcoming technology, events like GetGeeked are the ones to look forward to.

## LIGO -Virgo collaboration observes gravitational waves from colliding neutron stars

Event provides evidence for how heavy elements form

By Emma Bingham

Scientists announced Monday the first detection of gravitational waves from the collision of two neutron stars. Light from the collision was simultaneously observed by telescopes all around the world.

The LIGO-Virgo collaboration observed the signal on Aug. 17. LIGO, whose two interferometric observatories are located in Washington and Louisiana, has made four previous observations of gravitational waves from the collision of black holes

This particular observation is special because it was a neutron star collision rather than a black hole collision, and it was observed not only by LIGO in the U.S. but also by Virgo in Europe.

Not only is this collision the first event detected by both gravitational-wave and optical astronomy, but it has provided a wealth of observations that will contribute to insights in many different fields of physics.

## Detecting a neutron star

The gravitational-wave signal lasted 100 seconds, and its characteristics indicated that it likely originated from the collision of a pair of neutron stars with a combined mass of around 2.7 times that of the sun's mass.

Neutron stars are small, dense are that form when stare ten or twenty times the size of the sun reach the end of their lives and collapse in on themselves. They are the densest stars in the universe - if the stars they formed from had been any more massive,

they would have collapsed further to become black holes.

Scientists simultaneously observed a short gamma ray burst located in roughly the same area of the sky as the gravitationalwave signal.

Over the days following the first gravitational wave and gamma ray observations, more than 70 telescopes observed the afterglow of the collision in X-ray, ultraviolet, optical, infrared, and radio wavelengths.

The explosion produced when two neutron stars collide is called a kilonova. Scientists have long thought that such events are the source of many of the elements heavier than iron in the universe.

Stars, during their normal lifetimes, fuse light elements to re-

LIGO, Page 2

## **IN SHORT**

Flu shots will be available Oct. 24 between 8 a.m. and 6 p.m. in Walker Memorial.

A Starr Forum lecture entitled Syria: Which Way Forward?,

with speakers Robert Ford and Steven Simon, will take place today from 4:30–6:00 p.m. in 3-270.

Red Line trains will be running between Kendall/MIT and Park **Street** this weekend for the Head of the Charles Regatta. However, buses will replace the service most other weekends until Dec. 17.

Good luck on your remaining half-term final exams!

Send news and tips to news@ tech.mit.edu.

## **CAREFUL CHAOS**

East meets west in a gamelan concert at the ICA. ARTS, p. 8

## **RESPONSE TO SOCIOECONOMIC SURVEY**

New resources created for students facing financial hardship. OPINION, p. 4



## SHABU-SHABU

Hot pot: are we doing this right? ARTS, p. 7

## **PLEASE VOTE NOV. 7!**

Alum encourages students to vote in Cambridge elections. OPINION, p. 4

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Thursday, October 19, 2017

**WEATHER** 

## Warmth continues in the Northeast

By Jordan Benjamin

After a brief cooldown earlier this week, temperatures warmed yesterday and today under high pressure and sunny skies to the mid 70s. Tomorrow should be the coolest day of this warm period, as the high temperature should stall in the upper 60s. Over the weekend, temperatures will return again to the mid 70s, with lows in the 50s and clear skies as another high pressure system slides by the region. Enjoy your out-

door activities in this beautiful weather - it's a special treat for so late in the year! Towards the middle of next week, a cold front will sweep across the East Coast likely ushering in the coolest air of the season. This would end a remarkable stretch of warm weather; this October is likely to finish as one of the warmest ever for Boston. The average last 70°F day in Boston is around November 1st. Thus, the recent 70°F temperatures are not extremely anomalous; however, their longevity has been very surprising.

## **Extended Forecast**

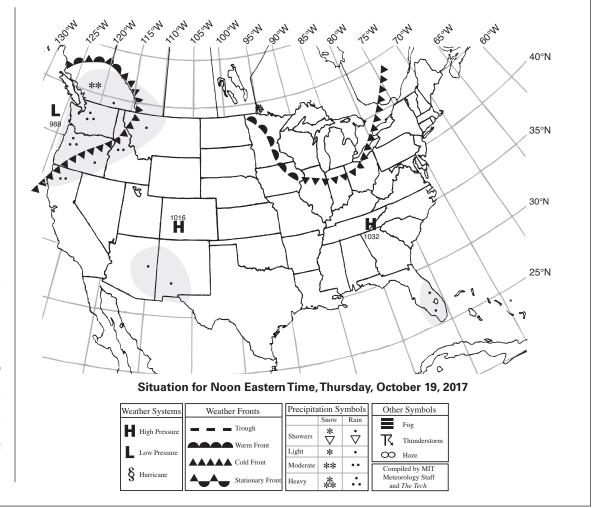
Today: Sunny. High around 73°F (23°C). Winds SW at 10-20 mph.

Tonight: Clear. Low around 55°F (13°C). Winds SW at around 10 mph.

Tomorrow: Sunny. High around 70°F (21°C). Low around 50°F (10°C).

Saturday: Sunny. High around 74°F (23°C). Low around 53°F (12°C).

Sunday: Sunny. High around 73°F (23°C).



# Do you have a question for President Reif?

Join *The Tech*'s news department! join@tech.mit.edu

## Virgo helps detect stars' location

LIGO, from Page 1

lease energy. They do not usually fuse anything heavier than iron because these processes require more energy than they release. A large supply of neutrons makes fusion of heavier elements possible, which is why kilonova are thought to be a source of elements such as gold and platinum.

In the optical observations of the neutron star merger, scientists detected spectra characteristic of these elements, providing support for this theory. The Virgo gravitational wave observatory

The addition of the Virgo detector allowed scientists to pinpoint the location of the gravitational wave signal much more accurately than in previous LIGO detections. The neutron star collision was pinpointed to an 28-degree area of the sky with a probability of 90%.

The Virgo detector, which is located near Pisa, Italy, started its first observing run this summer after being upgraded to Advanced Virgo

Do you like doodling during class? Are your psets covered with drawings? If so, become a Tech Illustrator!

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## **Solution to Flu Season**

			troi	n pa	ge 8			
1	2	3	8	4	7	5	6	9
7	8	9	5	1	4	2	3	6
2	3	4	9	5	8	6	7	1
8	9	1	6	2	5	3	4	7
9	1	2	7	3	6	4	5	8
6	7	8	4	9	3	1	2	5
4	5	6	2	7	1	8	9	3
3	4	5	1	6	9	7	8	2
5	6	7	3	8	2	9	1	4

## Solution to Specter from page 9

9	6	8	2	5	7	4	3	1
3	7	5	9	1	4	6	8	2
2	4	1	3	6	8	7	9	5
4	3		5	2	1	9	7	8
5	8	2	6	7	9	1	4	3
1	9	7	8	4	3	5	2	6
8	5	3	7	9	6	2	1	4
7	2	4	1	3	5	8	6	9
6	1	9	4	8	2	3	5	7

## **Solution to Streaming**



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## **GUEST COLUMN**

## Please vote Nov. 7

**By Piotr Mitros** 

There is an election in a few weeks. When I was a student at MIT, almost no one voted in municipal elections; they seemed so inconsequential. After I left MIT, I was surprised to find that participating in municipal elections has a direct impact on my life and a much greater impact than national elections.

Why?

In a digital democracy, in a very literal sense, only those who vote or donate have a voice. Elected representatives have tremendous amounts of data about you, including whether you're registered to vote and which elections you have participated in. Recently, I bumped into one of my representatives at a public event. I asked to speak for a few minutes; he initially excused himself, saying he didn't have time. I saw him check an app on his cell phone. When he came back, he "remembered" where I lived and a fair bit of background about me. Since his app showed I was civically engaged, he found time to talk at length about an issue affecting me. Virtually all candidates define their platforms by listening to their constituents based on voting records. In a digital democracy, the link between voting and influence is very direct; if you don't vote, politicians won't listen to you. Much like a credit record, building up that record early helps you in future years.

In addition, in contrast to national poli-

## **LETTER TO THE EDITOR**

## CASE leaders and MIT deans on financial hardship

Last week's *Tech* article on the Class Awareness, Support, and Equality (CASE) socioeconomic study was a stark reminder to the MIT community that financial hardship is a real issue on campus. It affects undergraduates and graduate students alike, often invisibly. At an institution like MIT, it is unacceptable for any student to go without basic needs due to a lack of funds.

We are excited to highlight some new resources for students facing financial hardship. An emergency fund—established by the Provost's Office and administered by the Division of Student Life—is tics, you and your friends can sway election outcomes. It only takes about 1700 votes to win a city council seat — less than a fifth of the MIT student body.

What are the major issues this election? The biggest issue is zoning and housing costs. Cambridge housing prices doubled in the past half-decade. As you may have noticed, most of Cambridge is three stories high and is no longer quite able to house everyone. That trend, combined with short-term rentals, lead to a lot of real estate speculation (much foreign). A basic 3-bedroom family home costs approximately \$1 million. To stay in Cambridge, as many students do after graduation, you will need two corporate jobs (for example optimizing ad clicks or designing financial instruments). Would you like to be an entrepreneur? A scholar? An artist? You'll need to move somewhere else.

There is natural friction between the people who invest in land to extract rent and resell (major universities, foreign investors, as well as older Cambridge residents) and the people who pay them (students, recent graduates, and younger families, priced out of the market). Most Cambridge politicians take a "compromise" position with affordable housing tools such as linkage fees and inclusive housing requirements. These tools block off a portion of the housing stock for low-income individuals. While a good idea, when combined with restrictive zoning and aggressive commercial

making grants to students who are struggling to obtain food, season-appropriate clothing, school supplies, or other necessities. To apply, undergraduates can email s3-associatedeans@mit.edu and graduate students can contact Dean Naomi Carton. They are ready to help students in need with discretion and compassion. And, following the recommendations of the Committee on Academic Performance's Review of the Undergraduate Withdrawal and Readmission Practices, funds are now available to offset the costs of transitioning away from MIT for students taking personal or medical leave.

Financial aid continues to evolve with input from students. MIT has increased its commitment to financial aid over the last two years, lowering the amount that all families are expected to contribute to their student's education, as well as lowering the student self-help expectation from \$5,500 to \$3,400. We know, however, that

development, these reduce supply for the middle class, and in a tight market, dramatically drive up prices for everyone else, while giving voters the impression that politicians support affordable housing. The major winners are existing landowners, as well as the few developers with enough political sway to win exemptions to zoning to build high-density units.

Campaign finance reform is the second major issue this election cycle. Cambridge is one of the least corrupt cities in the US but the price of entry has risen rapidly, which threatens to jeopardize that. A basic city council campaign breaks \$30,000. That's a level of spending where candidates move funding from richer friends and family to special interests.

Voting is easy. Register online by October 18th. Look over candidate platforms, profiles, and spending (less spending is better). Find candidates with thoughtful, concrete, and specific plans which can be executed in the two-year term. A transparent plan you disagree with is better than no plan. Avoid candidates who merely express empathy or give empty phrases such as, "Develop a plan for affordable housing and future development." In Cambridge politics, asking for studies (with no plan for action) is usually a dodge.

So come November, please hit the polls! Voting now can make a big impact on your life in the future. Happy voting!

Piotr Mitros SB '04, PhD '07

just increasing financial aid will not solve the problem.

MIT is also taking other steps related to financial hardship, and we want to make sure that you know about them. Dean David Randall of Student Support and Wellbeing and students from CASE, in addition to others, are part of a working group that will recommend how to best address food insecurity at MIT. Moreover, we are forming a coalition of student, faculty, and staff stakeholders who will work together to make sure that students in need have access to ongoing and sustainable support from the Institute.

We appreciate that this is not an easy topic to discuss. Please reach out if you need assistance. We are here to help.

Suzy Nelson, Dean for Student Life Stu Schmill '86, Dean of Admissions and Student Financial Services Tchelet Segev '18, CASE René A. García Franceschini '19, CASE

## CORRECTIONS

In an article about Mexican journalist Jesús Esquivel last

week, Alonso Espinosa Domínguez's name was misreported as Alonso Domínguez. The second-page headline also implied that Esquivel spoke about the crisis in rural schools, but it was mostly Professor Tanalís Padilla who spoke about this.

## **OPINION POLICY**

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**Dissents** are the signed opinions of editorial board members choosing to publish their disagreement with the editorial.

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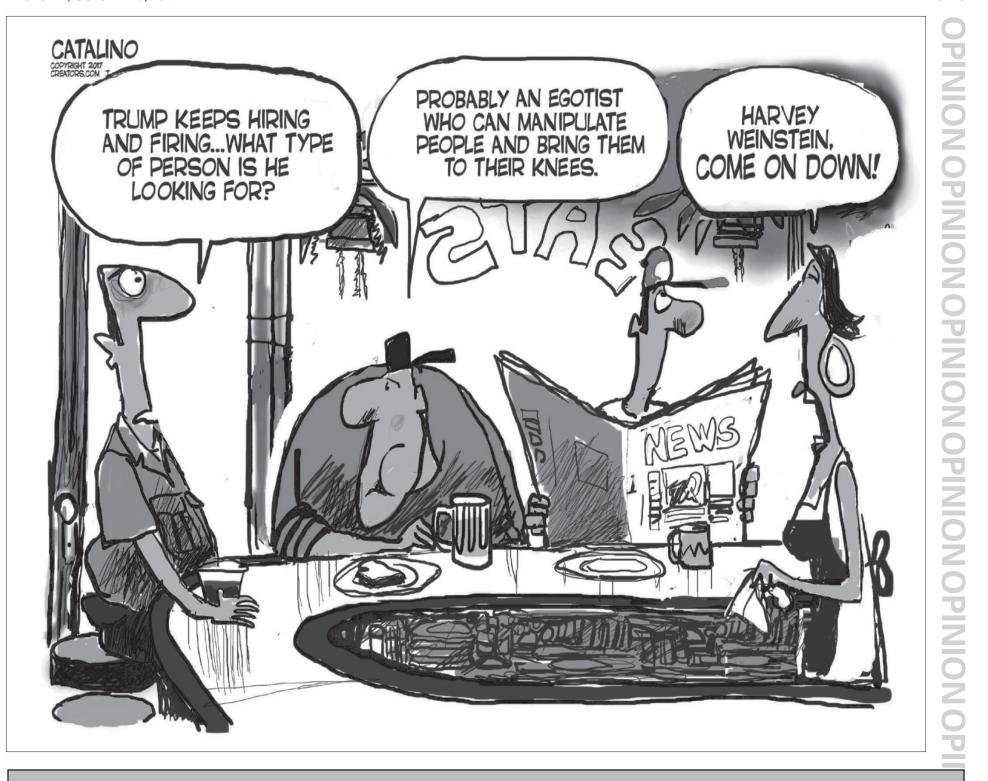
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Thursday, October 19, 2017



## DID YOUR MIT ESSAYS GET YOU IN?

The Tech is collecting successful application essays (hint: yours!).

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THURSDAY, OCTOBER 19, 2017 6 THE TECH

## THEATER REVIEW

## Coping with trauma abroad

The world premiere of A Guide for the Homesick examines gay identity, betrayal, and acceptance in contemporary times



T. CHARLES ERICKSON

Samuel H. Levine and McKinley Belcher III in A Guide for the Homesick.

## By Ethan Vo

In a seedy hotel room in Amsterdam, two strangers connect and struggle as they wrestle with their pasts. With this simple premise, Ken Urban crafts a story which explores betrayal by those dearest to us and the psychological trauma brought on by volunteering in foreign aid efforts. Central to these conflicts are the issues of grappling with sexuality and coming out in a contemporary age of purported acceptance. Urban, who is an MIT Senior Lecturer, drew inspiration from self-conducted interviews with Doctors Without Borders participants and the violence against LGBT people in Uganda. Supported by high energy performances by its two actors, the result is a riveting drama which tackles these issues in a densely packed 75 minutes.

The two strangers are Teddy and Jeremy: Teddy is a charismatic businessman who invites Jeremy up to his room after conversing in the bar. Despite his intentions, he reveals early on that his friend has gone missing after an episode of manic depression and his own desire for company. On the other hand, Jeremy is a nervous Harvard graduate who recently finished a volunteer aid effort in Uganda. While it is tempting to draw comparisons with other neurotic gay Jewish characters in theatre such as *Angels in America*'s

Louis Ironson or William Finn's Marvin, Jeremy's main motivations stem from his trauma and guilt as a nurse. Despite their repeated unwillingness to admit the truth of their betrayals, Urban's dialogue continuously fleshes out these characters, creating powerful and sympathetic scenes as their stories unravel.

McKinley Belcher III (Teddy) and Samuel H. Levine (Jeremy) both give powerhouse performances in their respective roles, showing great versatility as memories suddenly enter the narrative. Even more impressive is their grasp on their characters when identities begin to blur as in Angels in America. As the niceties finish, Belcher provides a gripping physical-

## A Guide for the Homesick

Written by Ken Urban

**Directed by Colman** Domingo

Oct. 6 – Nov. 4, 2017

Wimberly Theatre, **Calderwood Pavilion at** the Boston Center for the Arts

ity which is matched by Levine as his own character navigates through self-loathing and mental breakdowns. There are some points in their beginning interactions which feel artificial, but the brokenness of their characters and their emotional depth make me question if it is an intentional decision.

The set design effectively communicates the themes of space and time in the play. The walls of the set convey the hotel room's intimate and cramped nature, evoking the symbolism of the room both as a temporary bubble from the outside world and as the closet for LGBT people. However, with shifts in lighting, the memories of past and present occupants invade the hotel room, transporting scenes across space and time. Despite the narrative complexities of the play, the lighting changes and dialogue shifts made these transitions in setting very clear.

As Urban notes in his research, the teachings of evangelical American pastors, even from Massachusetts, transformed the sentiment towards LGBT people in Uganda from indifference to the persecution they face there now. Witnessing this violence shatters the hopeful idealism that Jeremy's sheltered upbringing nurtured in him, while Teddy's interactions with his friend leading up to his disappearance haunt him equally. As their time in the hotel finally runs out, we, the audience, are left to ponder the question alluded to by the title: how do we go back

## **OPERA REVIEW**

## **Boston Lyric Opera opens its season with a** compelling Tosca

A touching production of Puccini's classic opera

**Presented by Boston Lyric Opera** 

Conducted by David Stern; Directed by Crystal Manich; Music by Giacomo Puccini; Libretto by Luigi Illica and Guiseppe Giacosa

**Emerson Cutler Majestic Theatre** 

219 Tremont St

Playing through Oct. 22

## By Alexandra Sourakov

STAFF WRITER

Tosca tells a tale of feminine strength and power in a masculine world. The Boston Lyric Opera (BLO) stages a traditional interpretation of Puccini's famous work, setting it in 18th century Rome, replete with vying political factions and a towering religious edifice. Our eponymous (meta) heroine, Floria Tosca (Elena Stikhina), is a passionate opera singer determined to save her lover, Cavalier Cavaradossi (Jonathan

Burton) from the clutches of Baron Scarpia (Daniel Sutin). We have the satisfaction of seeing the vain, jealous Tosca of Act I transform into the decisive and brave Tosca of Act III. She asserts herself despite all odds and, although we know it will not end well, we are cheering for her the entire way.

In order to accommodate the full orchestra that the opera required in the Cutler Majestic Theatre, the BLO made the ingenious decision to merge the orchestra with the set design by placing the musicians and conductor on a raised tier on stage. Veiled coyly by a shim, the audience can see the

conductor and can only catch tantalizing the way Scarpia is often portrayed. There ment has the added effect of making it even more apparent how the action on stage and the plot are not the centerpiece, but are conduits for our appreciation and interpretation of the musical score. Because each character is paired with a distinct melody, a leitmotif, in Puccini's score, the orchestra and singers dance a synchronous duet.

Although this theatre is not the permanent home of the BLO, it was an excellent host — the acoustics were wonderful and the soaring notes sailed cleanly to all corners of the theatre. Elena Stikhina's voice, debuting in the U.S., was especially notable, with a piercing, heart-wrenching quality, at times coalescing with the instruments and at other times, vibrantly striking out on its own. When Floria Tosca is faced with the decision of giving up her body to the repulsive Scarpia or seeing her lover put to death, the agony of this moment is transmitted to us through a powerful (Mozart would have termed it "golden") silence which rises to a crescendo, finally to be broken Elena Stikhina's exquisite execution of the "Vissi d'arte" aria. I got chills, and it wasn't because I was cold.

Daniel Sutin played a solid Baron Scarpia but seemed a bit subdued compared to

Scarpia, as is the case with many villains in grand opera, so I feel that it is perfectly acceptable for the singer to embrace the vileness of the character in full. For Tosca's victory to be triumphant, she must face a worthy opponent. There is something in Scarpia to be pitied. He is jealous of the freedom and joie de vie that Tosca and Cavaradossi. Head of the secret police, Scarpia possesses significant political power, and yet, he cannot charm a woman. He sings that he prefers to take women by force ("For myself the violent conquest"), for that is what he enjoys, but perhaps this is simply a protective layer of self-delusion in a man who cannot get women any other

Baritone David Cushing was superb as Angelotti, and I only wish he could be allotted more stage time. Jonathan Burton, as Cavalier Cavaradossi, makes an equally great happy, playful lover and tortured prisoner. The final scene was understated and touching - not something one always encounters in grand tragedies. Tosca's shriek on discovering her lover's fate struck deep. I unreservedly recommend this staging of *Tosca* to those familiar with the work and those new to opera, alike.

## **MOVIE REVIEW**

## Bombs, blackmail, and tranquilizers: how to extract information from someone

Jackie Chan returns in yet another classic action thriller

By Muskaan Aggarwal

The Foreigner starts out simply enough a dad picking up his daughter from school to take her prom dress shopping. Within seconds, however, the calm beginning is blasted to pieces by an explosion that kills the man's only living relative, his daughter. From the aftermath of the bomb, a classic action thriller is born.

The storyline of The Foreigner follows Quan (Jackie Chan), whose only purpose left in life is to avenge the murder of his beloved daughter by the bombers, a group called the "Authentic IRA." In doing so, he becomes convinced that Liam Hennessy, the former IRA leader turned Irish deputy minister, knows the bombers. Thus, Quan leaves his whole life behind to elicit the names and locations of the bombers from Hennessy.

Once Quan's daughter is killed, the rest of the storyline becomes, in essence, predictable. From the moment the bomb goes off, it is obvious that despite the British police's extraordinary resources and effort, Quan will be the one to locate and kill the bombers. The only question that remains is how. It is here, in answering this question, that the movie does justice to the label "action thriller." Quan quickly realizes that Hennessy sees him only as a grieving father and thus will not give him the names of the bombers. So, making use of his special ops background, Quan makes Hennessy fear him — he plants small bombs in Hennessy's office and country home, takes blackmail photos, and even manages to get past the numerous security agents and ex-British special ops agent Hennessy has seeking out Quan. It all works, both on Hennessy and the audience. Much like Hennessy, you find yourself waiting for Quan's next move, and subsequently, are awed by his sheer brilliance. You inwardly chuckle at Hennessy's stunned look when he discovers Quan inside his country house; you smile at Hennessy's resignation when he sees his expert tracker nephew returning without Quan; and you outright laugh when British special forces find all the bombers dead in their apartment as Quan slips out of the building with a puppy in his arms.

All in all, *The Foreigner* is your typical

**★★★☆☆** 

The Foreigner

**Directed by Martin Campbell** 

Based on Stephen Leather's novel The Chinaman

Screenplay written by David Marconi

Starring Jackie Chan, Pierce Brosnan, Michael McElhatton, Liu Tao, Charlie Murphy, Orla Brady, and Katie Lueng

Rated R, now playing

action thriller recipe. The quintessential former special ops agent, backstabbing comrades and kin, extra-marital affairs, and underhanded politics are all mixed together to make this recipe work. To a degree, it does. While by no means is this a heart-pounding, chair-gripping nail-biter, you find yourself rooting for the grieving Quan as he gets

closer and closer to avenging his daughter's death. If you're a Jackie Chan fan or want to see how a 60-year-old restaurateur's incredible ingenuity allows him to dodge trained operatives, elicit sensitive information from a powerful politician, and take revenge before the British police can apprehend the bombers, I say give The Foreigner a chance.

## **RESTAURANT REVIEW**

## As long as it tastes good, you're doing it right!

Master your hot pot abilities at Boston Spring Shabu-Shabu

Hot Pot, \$\$

Lunch daily: 12 p.m. - 3 **Dinner Monday – Friday: 6** p.m. - 10 p.m. **Dinner Saturday &** Sunday: 5:30 p.m. - 10

304 Western Ave **Brighton, MA 02135** 

By Mariam Dogar

STAFF WRITER

I'm lifting chopsticks towards my mouth when, suddenly, I see a flash of something yellow-colored flying my way. A tiny spot on my lower neck stings, briefly burning up. A few seconds later, my brain finally registers that I was attacked by piping-hot stuffing that made a fast break, squirting out of my companion's dumpling-like "fishball" from across the table when she applied too much pressure.

We broke out in laughter; this was just one of many instances in a series of hot pot blunders. Is this cooked yet? How do you take off the shell of a crab? Is my oven at the right setting? However, despite how unskilled and inexperienced we were, we still managed to have a truly amazing dinner at Boston Spring Shabu-Shabu.

Our waitress summed the Spring Shabu-Shabu experience up perfectly: "If it tastes good and you're having fun, you're doing it right!" She answered all of our rookie questions with a smile and was extremely helpful, though she reminded us that there was no right answer. Even if we wanted to put pumpkin noodles, lotus root, pineapple sesame sauce, and top neck clams in Spicy Dashi broth, we absolutely could!

My friend and I really liked the cool and clean aesthetic of the restaurant; the layout of the buffet was slick and simple. A plentiful array of beautifully-cut fresh vegetables, mushrooms, noodles, and protein were laid out on ice. Current top hits played on the sound system in the background, contributing to the restaurant's hip vibe.

Surveying the buffet was such a fun experience for me. Everywhere I looked were new potential ingredients to throw in my hot pot that I had never even heard of, like kabocha, bamboo shoots, Enoki mushroom, fuzzy squash, wood ear mushroom, cellophane noodles. I quickly piled up my tray, which ended up looking pretty Instagram-worthy.

After collecting all your ingredients (or, in my case, the first of many trays of ingredients), you cook them in a Japanese-style hot pot. This makes for an incredibly fun and interactive dining experience that is very engaging and likely to be a hit with your guest. You have the option of sliced meats, tofu, or assorted seafood items along with the various vegetables, fishcake, and noodles that you can cook at your table. Shabu-Shabu is actually derived from the "swish-swish" sound made when cooking the meat in the broth by quickly brushing it back and forth — a technique you will quickly pick up if it's your first time.

The broth and ingredients had fresh flavors that complemented each other. In addition, most of the food was light and healthy, which helped me feel less guilty about the amazing green tea ice cream that I topped the dinner off with. Going to Spring Shabu-Shabu was a great time and learning experience. Whether you are a hot pot connoisseur or just someone who wants to finally take control of your meal and try something new, I definitely recommend making the trek over to Spring Shabu-Shabu.



A spread of vegetables and meats ready to be plunged into broth.

## **VIDEO GAME REVIEW**

## Beware archmages secretly ruling on deserted

Battle Chasers: Nightwar brings to life an old comic book in an appealing way



Battle Chasers: Nightwar

**Developed by Airship Syndicate** 

**Designed by Ryan** Stefanelli

Rated T for Teen

By Nathan Liang STAFF WRITER

Upon startup, Battle Chasers: Nightwar presents a beautiful animation reminiscent of comic books. The motions are smooth and the colors are brilliant; one thing I did not expect was the well-done voice-acting in an RPG-style game like this. Each character is made all the more distinct by its corresponding voice actor. Their personalities shine in all the nuances, like in the grisly, stern voice of Garrison and the wiry, suspicious drawl of Quall the

The general storyline is relatively simple. The story stars Gully, a teenage girl, whose missing father, Aramus, was a heroic warrior known for the invention of his powerful gauntlets, which were passed down to Gully once he disappeared. Upon acquisition of these gauntlets, many began chasing after Gully in search of her new power, and the young teen was forced to flee and fight for her life until she met Garrison, an ally and friend of Aramus. Garrison swore to protect Gully as soon as her father disappeared. Along the way, they recruited Knolan, the wizened wizard, his mysterious partner Calibretto the war golem, and the finicky rogue Red Monika.

The gang starts off the game in search of a hidden island rumored to be brimming with mana. They're attacked by airships of bandits as the island comes into view and they're separated in the midst of the chaos. Calibretto (whose personality reminds me fondly of Alphonse from Fullmetal Alchemist) protects Gully and Garrison during the crash. Meanwhile, Knolan and Monika are nowhere to be found. The aforementioned trio thus set out to look for their missing friends and run into the controversial topic of mana along the way. The power of mana is great, yet those who are willing to acquire it are even more dangerous. The inhabitants of the island also prefer to not acknowledge the existence of the dwindling sources of mana.

Gameplay-wise, Battle Chasers plays very nicely. The battle mechanics are easy to use and simple enough to understand. The fights are turn-based and evocative of old school Final Fantasy. The motion of the characters in-game are fluid. The design and artwork is beautiful and pleasing to the eye.

They even include the small detail of change ing character appearance when you change certain pieces of equipment.

Another lovely part of the game is that the soundtrack establishes the ambiance of the game and helps immerse the player into the game. Ruins are serene and peaceful (unless littered with horrifyingly large spiders), while the arid Rushlands are a place to be wary of. The bits of reading and un-voiced narration involved also help contribute to the feel of the game's world. They reveal concurrent stories of other smaller characters, political dealings that affect the world, and important history and lore that shape the ideologies and beliefs surrounding the mana-infested island.

Overall, Battle Chasers: Nightwar highlights an unoriginal plot, but it makes up for it with stunning visuals and hours of easy, addictive gameplay. I recommend this game to RPG-lovers and casual players alike, though the price tag attached may be a bit loaded for some.

**CONCERT REVIEW** 

## The tide of expression flows for you

An exploration into the expressive power of the orchestra



**Gil Shaham performed** Tchaikovsky's Violin Concerto with Andris Nelsons and the BSO.

Week 3: Arlene Sierra's "Moler" (2012), Tchaikovsky's Violin Concerto in D, and Rachmaninoff's Symphony No. 2 in E Minor

**Boston Symphony Orchestra** 

Oct. 7, 2017

## By Torri Yearwood

STAFF WRITER

Every time that I go to the symphony hall is like the first time; I walk in, am visually struck by the architecture and displays, and proceed to be auditorily blown away by the orchestra. This concert was no different in that regard.

The opening piece "Moler" by Arlene Sierra easily wins out for newest piece that I've heard at the hall so far, having been written in 2012 (so modern, in fact, that the composer was there, and came up for bows!). It definitely felt very different as well, not being nearly as consonant or "ordered" as the contrasting Tchaikovsky and Rachmaninoff pieces later, but introduced an idea central to the rest of the concert: ebbs and flows.

Then began Tchaikovsky's Violin Concerto in D, played by the passionate and energetic Gil Shaham. Weaving melodies and countermelodies in and out of the orchestra, he built tension while pacifying the excitable strings. Amongst these melodies were soft and sad strings, triumphant winds, dramatic

horns, and above the swells of all of them, the soloist introduced new melodies: folk-like at first, then nostalgic, lonely and consoling, all rolled into one instrument (which almost sounded like two at times). Being long, complex, but quite palatable, this piece now has a special place in my heart.

As always, the last piece took the show. Rachmaninoff's one-hour masterpiece, can be described as nothing but beautiful. From the dark opening, to the melodies that are hopeful, submissive, happy, and depressed all at once, to the intermittent wind solos and solis, to the tonal and dynamic power of the orchestra, I was taken on an emotional roller coaster. There were points where the orchestra became almost silent, causing the audience to hold their breath, waiting to be reassured by the return of a romantic or hopeful theme. But as with real life, it doesn't always end how you expect it to, sometimes in the form of a soloist giving a touching soliloquy, sometimes a triumphant explosion of sound, and sometimes, sad chords brought on another theme, but always flowing.

**CONCERT REVIEW** 

## MIT — SO musical

## Adam K. Boyles conducts the MIT Symphony Orchestra

## MIT Symphony Orchestra

Conducted by Adam K. Boyles

Kresge Auditorium

Oct. 13, 2017

## By Zoe Anderson

Right from conductor Adam K. Boyles' downbeat, MIT Symphony Orchestra (MIT-SO) delivered a brilliant performance, featuring Beethoven's "Coriolan" Overture and Tchaikovsky's Symphony No. 4, as well as

Concerto for Flute and Orchestra in E minor, by MITSO's own Bertrand Stone '18.

In Beethoven's "Coriolan" Overture, MITSO expertly executed the boldness desired by the composer. The musicians transitioned perfectly and smoothly handed off the melody between sections, enabling the piece to develop into a brilliant and uplifting experience.

MITSO's rendition of Stone's flute concerto, with soloist Kyle Swanson '18, was incredible. Speaking of his work, Stone joked that "It's pretty self-explanatory. It's a lot of notes, basically."

Stone set out to write a flute sonata for his friend Swanson last May, but ended up outdoing himself and creating a three-movement concerto. MITSO rehearsed it with dedication from the beginning of this semester.

"I can go on and on about how amazing Bertrand is," said Nanette Wu '20, a clarinetist in MITSO. "[In rehearsal], every time we play[ed] something good, a huge smile [went] on his face. It was an honor to get to play for him."

Throughout the work, Swanson's mastery of his instrument was evident. He executed the piece's many technical passages with delightful grace.

"I was just so impressed at how effortless the whole solo sounded," said Alex Ferguson G. "Everything the the flute did was incredibly well-replicated in the orchestra... it was definitely a conversation between the two".

At the conclusion of the third and final movement, the audience sat in silent amazement for a moment before rising to give Swanson and MITSO a standing ovation.

MITSO finished strongly with the Tchaikovsky's famous fourth symphony. Before the performance, Boyles explained some context about the piece and its brilliant composer. He first asked everyone whose first time it was hearing a symphony orchestra to applaud. A significant proportion of the audience was new to this art form. Boyles then declared that MITSO is "not an impenetrable entity" but rather a "welcoming, inclusive entity."

As Boyles explained, Tchaikovsky's fourth symphony is an expression of his struggles with melancholy as he tries try to join in with the happiness of the world around him while fate, represented in the recurring 12 beats, darkly holds him back. The musicians expressed this idea perfectly, culminating in the frenzied fourth movement.

At the end of the night, the audience leapt to their feet. Honoring the composer, Boyles lifted up the score from the Tchaikovsky, to the audience's thunderous applause.

## **CONCERT REVIEW**

## The great gamelan

## A combination of Eastern and Western instruments astounds

By Patricia Gao

The curtains are open.

This is unusual for the Barbara Lee Family Foundation Theater, a large room in the Boston ICA with plush orange seats and glass walls overlooking the harbor. But the concert happening here tonight is unusual, too. It's like a wedding anniversary.

Most of the instruments onstage, known as gamelans, belonged to one of two percussion ensembles. The gamelans, Old Granddad and Si Betty, were created by a musician named Lou Harrison, who passed away in 2003. Harrison was well-known for liking Eastern music, especially the kind produced by Javanese gamelans. He was also known for "marrying" Eastern and Western music — between the gamelans, there is a piano

onstage. Playing by the gamelans were a violin and two clarinets.

Lights dimmed. Members of Gamelan Galak Tika, an MIT organization founded in 1993, filtered onstage and take their places at their instruments. It seemed that the whole gamelan awakened at once: each song feels like a serious, rhythmic breath that swells to fill the room. Certain sounds stood out to me, but they were difficult to place when so many hands are hammering in sync. I give into the idea that a gamelan is a single musical entity rather than a collection of the same.

To me, Eastern tunes remind me of gardens in various stages of the day. Some of them are chilling, like moonlight; some of them evoke the sense of a vine growing. As the concert progressed, Western instru-

ments were added. At first, it felt strange to hear the smooth slide of a violin conversing with the cavelike echoes of a gamelan, but over time, it sounded just right.

It's hard not to close your eyes when listening to music when the melody fills all of your senses at once. Harrison did something wonderful in creating American gamelans, and in writing music that would allow collaboration between them and traditionally Western instruments.

The pieces played were varied. Some were bright, some were dark. One explored how Eastern tuning characterizes a piece; one was fast-paced and harmonious, sounding almost standardly Western. What the songs had in common is their construction — a careful kind of chaos that stops just long enough on a tone for me to commit it

## Mr. Harrison's Gamelans

Centennial Celebration of the Music of Lou Harrison

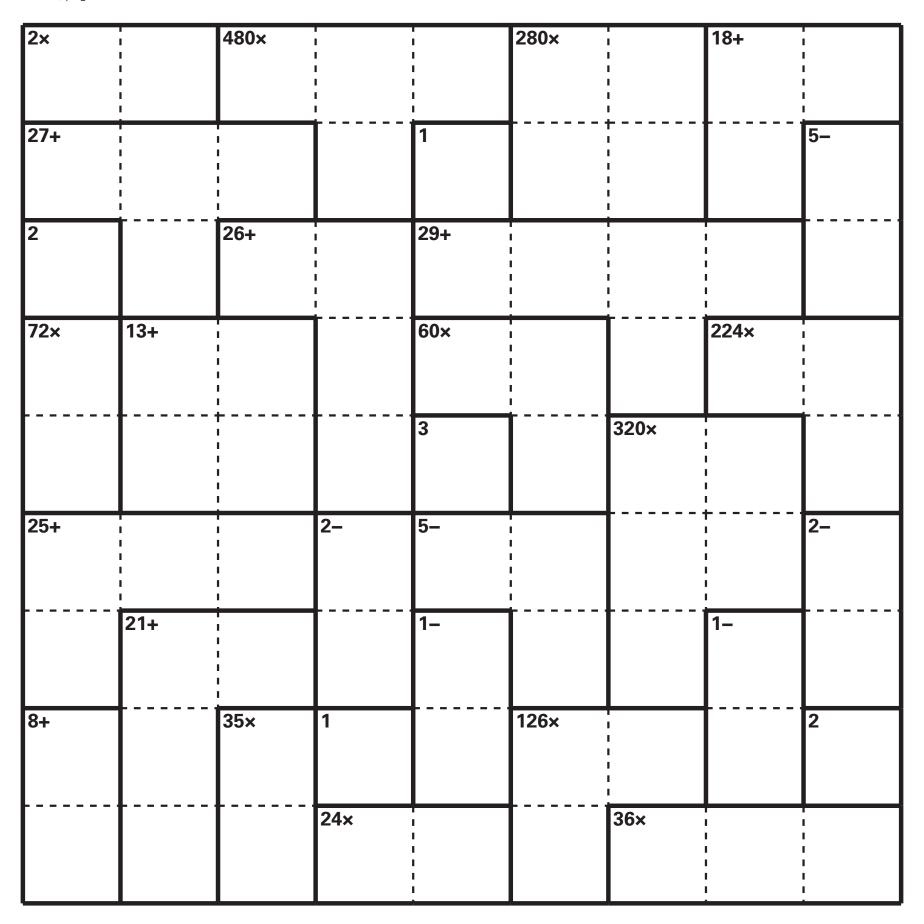
Institute of Contemporary Art, Boston

Oct. 12, 2017

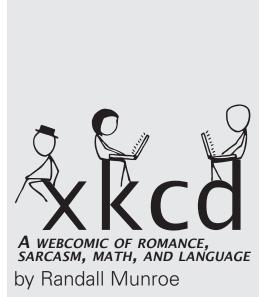
to memory. I spent the journey home contented, my ears still wrapped in the concert's final note.

## Flu Season

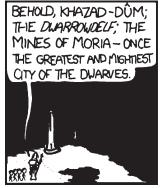
Solution, page 3



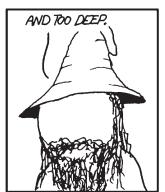
Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–9. Follow the mathematical operations for each box.



## [760] Moria







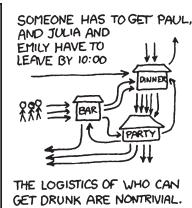


Someone should really bring them a ladder and remind them to build the Endless Stair \*first\* next time.

## [589] Designated Driver









Calling a cab means cutting into beer money.

## Streaming Audio by Mark McClain

Solution, page 3

### **ACROSS**

- 1 Family nickname
- 5 1981 Oscar winner as Loretta
- 10 Holds up
- 14 Colossal
- 15 Show regret
- 16 Crunchy cheesecake ingredient
- 17 Emma Bovary creator
- 20 Mall tenant, often
- 21 Stable sound
- 22 Disparaging remark
- 24 Profs' helpers
- 25 Links org.
- 27 DOJ arm
- 28 Whodunit elements
- 30 Hassle, for short
- 31 Little tree climber
- 32 Parisian prayer addressee
- 33 Fancy trimmings
- 35 Show Boat impresario
- 39 Word on the South American capitals list
- 40 Has a balance

- 43 Crock, for one
- 46 Capture by surprise
- 47 Not inert
- 49 Hosp. area
- 50 Facebook giggle 51 Swampy spot
- 52 Squelch
- 53 Sunlit lobbies
- 55 Rotten
- 57 Adapts easily
- 62 Olympics implement
- 63 Strike down, old-style
- 64 Evening in Pisa
- 65 Pitchfork prong
- 66 Distance runner
- 67 Poetic tributes

## **DOWN**

- 1 Eldest of the "Little Women"
- 2 The Simpsons shopkeeper
- 3 Troublemaker's doings
- 4 Overture follower 5 File-menu command
- 6 News bits
- 7 Sectional, e.g.

- 8 NBC skit show
- 9 Assenting vote
- 10 Boxer's garb
- 11 Big potato processor 12 Norwegian port
- 13 With the result being
- 18 Social starter 19 Without the wherewithal
- 22 Terrible
- 23 Will Smith biopic role
- 25 Very fussy ones
- 26 Part of 25 Across 29 Eyedropper part
- 30 Hospital area
- 33 Ultimate 34 Problematic roommate
- 36 Western stock character
- 37 Not a one
- 38 Declined gradually
- 41 Manning in a huddle 42 Gender
- 43 Rolex alternative
- 44 Squid cousins
- 45 Serving piece
- 47 Nature personified
- 16 18 22 | 23 29 32 36 | 37 40 49 50 53 58 | 59 60 |61 62 63 64 65 66 67
- 48 Fairy tale giant
- 51 Vertical-sided hill 54 "Got it!"
- 55 Punxsutawney groundhog 56 "In that case ... '
- 58 Doctrine
- 59 "We don't need to hear that"
- 60 Underground resource 61 Took place

## **Specter**

Solution, page 3

				5		4	3	
3	7		9	1				
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Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

## **Pumpkin**

Solution, page 12

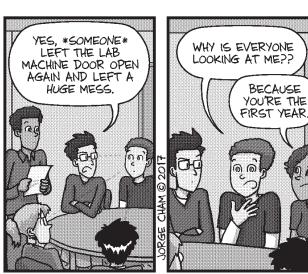
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Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.









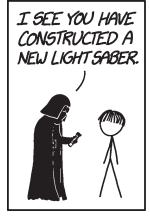
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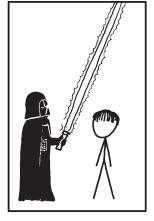
Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–9. Follow the mathematical operations for each box.

# A WEBCOMIC OF ROMANCE, SARCASM, MATH, AND LANGUAGE by Randall Munroe

## [1433] Lightsaber



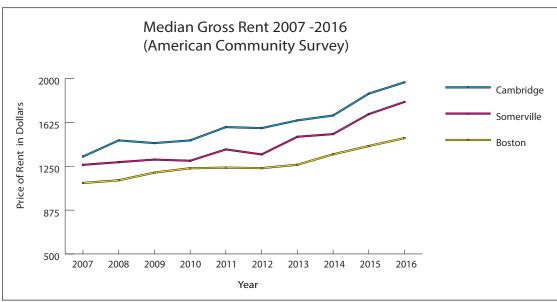






12 THE TECH THURSDAY, OCTOBER 19, 2017

## Survey finds estimated demand for on-campus housing among grad students around 1,100 units



IVANA ALARDIN—THE TECH

Median gross rent from 2007–2016 in the Boston area. Gross rent refers to the sum of rent and estimated utility bills. Data shows the most recent results of the American Community Survey from the U.S. Census Bureau.

## Housing, from Page 1

group, according to Blynn. Volpe working group chair Steven Hall SB '80 SM '82 ScD '85 could not be reached for comment. However, MIT Office of Government and Community Relations co-director Sarah Gallop said in an interview with The Tech, "There were over 70 public community meetings to gather input about the Volpe site."

In July, the graduate students collaborated with the MIT Graduate Student Council to conduct a survey to gauge the potential demand for graduate student housing. The results showed there would be an unmet demand for 1,450 beds if there were no changes to the current housing system. The analysis also attempted to gauge the housing demand if larger changes about price, allocation lottery, keeping rooms, etc. were made. After sampling a combination of the most popular choices, the report found that such changes could create demand for 1,800 units.

### Establishment of Graduate **Student Housing Working Group**

The GSC met with Chancellor Cynthia Barnhart PhD '88, Provost Martin Schmidt SM '83 PhD '88, and Treasurer Israel Ruiz SM '88 to discuss the lack of graduate housing in early August. "The zoning petition was a thought we had before our discussions with the administration, but we didn't have an exact solution," GSC President Sarah Goodman G said in an interview with The Tech.

Barnhart announced her plan to create the Graduate Student Housing Working Group to assess the graduate housing needs on Aug. 3. 'The working group is bringing all the involved parties to the table. Projects happen through partnership among students, administration, and faculty to help us realize the vision for more housing," Barnhart said in an interview with The

Ruiz noted some financial constraints of building new housing. "MIT is faced with competing demands for buildings to support priority academic uses and housing for both undergraduate and graduate students." Ruiz said in an email interview.

"It's a complicated issue and you need to gather as much data as possible," GSC Secretary Orpheus Chatzivasileiou G said in an interview with The Tech. "There's a lot of options on what to build, and things have also changed over the past three years since the Clay Report [a 2014 report done by a similar Graduate Student Housing Working Group that assessed housing needs], including the administration."

However, some graduate students still weren't satisfied with a working group. In 2014, the working group that published the Clay Report identified demand for 500-600 beds, but MIT is currently only building 250 net new beds in Kendall Square. Blynn said, "We felt like we had seen this history three years ago, and we were concerned that another working group alone wouldn't meet the housing needs of graduate students."

Barnhart elaborated on the process of building a new structure. "It's a complex challenge to go from idea and identification of need to having a design that is approved by the city and is ready to go," Barnhart said. "We have been doing campus planning to understand where we have opportunities to add beds."

MIT has already increased the percentage of graduate students housed on campus, from 27 percent in the 1980s and 1990s to al-

### MIT's Volpe zoning petition and GSAN's proposed amendment

most 40 percent today, according to

Barnhart.

The Volpe zoning petition is a mixed-use zoning petition with the city of Cambridge that MIT filed on Jun. 21 to build four commercial buildings, four residential buildings, and 2.5 acres of regional open space. In total, the space would be divided into 60 percent commercial retail space and 40 percent residential space, according to Gallop. By Cambridge law, 20 percent of the 1,400 residential units would have to be designated as affordable

GSAN filed an amendment to the Volpe zoning petition on Aug. 14. It called for a total of 1,800 units, based on the results of a survey that the Graduate Student Council conducted in July. Specifically, it requested 1,100 housing units for single graduate students and 700 units for families to be built within 1.5 miles of the Volpe parcel in phases during the redevelopment.

The Cambridge City Council has to make a decision whether to adopt the GSAN zoning petition amendment before the Volpe petition expires on Oct. 31.

### **Ordinance Committee hearing** on the petition amendment

MIT faculty, City Council candidates, Cambridge politicians, and local residents voiced their support for GSAN and attended the Ordinance Committee hearing for the zoning petition amendment.

Jonathan King, biology professor and MIT Faculty Newsletter editorial board member, said in an interview with The Tech, "My research depends on graduate students, and they are the key to research at MIT. If they have to spend so much time commuting, it makes labwork very difficult."

"It's a win-win approach," Zondervan said in support of GSAN's petition in an interview with The Tech. "MIT provides affordable housing on campus for graduate students and there's more housing available for Cambridge residents.

At the hearing, Somerville resident Bill Cavallini detailed his personal experience in regards to the affordable housing crisis. "I had to leave Cambridge in 2004 after 30 years as a tenant organizer and affordable housing advocate. The primary reason was lack of affordable housing options after the loss of rent control in 1994. Before 1994, taxicab drivers like myself could barely afford to live in most neighborhoods in the city," Cavallini said at the hearing. "Afterwards, and to this day, you will find very few drivers living anywhere in Cambridge other than publicly subsidized housing."

The PowerPoint that GSAN presented at the hearing included a comparison to Stanford University's current work in spending \$1.1 billion to build 2,020 net new housing units, which would house 75 percent of their graduate students. Blynn said, "We knew MIT could make graduate housing a priority if it wanted to."

There has to be an element of fairness. If MIT is bringing thousands of workers here as a result of Volpe, they have to work to balance these effects by providing more housing for graduate students," City Councillor Dennis Carlone said in an interview with The Tech.

City Councillor Leland Cheung MBA '10 was hesitant to delay the Volpe redevelopment at the expense of building more graduate housing. "I'm a little conflicted on how far we really want [MITIMCo] to do nothing with the Volpe site if they don't concede to the demands of more graduate housing," Cheung said at the hearing. "Am I willing to sacrifice all the good that's going to come out of redeveloping Volpe for the city?"

Others thought that the zoning petition amendment was the best way to get MIT to cooperate. Quinton Zondervan SM '95, City Council candidate, said at the hearing, "With the Volpe development, we have some leverage to get MIT to discuss the issue. If we approve the Volpe petition without addressing the graduate student housing petition, all that leverage is lost and we won't get MIT to agree to build affordable student housing we need."

## **Results of the Graduate Student Housing Working Group survey**

The working group released an interim report on the results of a conjoint survey they conducted from Sept. 29 to Oct. 9. It estimated preference for 1,000-1,100 additional beds for students in on-campus housing and determined that graduate students valued price, unit type, and short commute time over building amenities and a sense of community.

The report first gave background about the current Cambridge rental market, MIT's growing graduate student population, and MIT's previous work in building graduate housing.

It also suggested that MIT develop a process to evaluate possible changes to housing policies, such as a review of the campus housing allocation process and assistance with the off-campus housing search.

The report recommended a detailed housing evaluation every three years.

"The working group is 100 percent open discussion, and we're making a lot of progress between the administration and graduate students in trying to really understand graduate housing and how we can improve it," Vice Chancellor and Graduate Student Housing Working Group Chair Ian Waitz said in an interview with The Tech.

## Response to the working group report on graduate housing

Based on the interim report, the MIT administration sent an email to all graduate students on Oct. 16 promising to apply for permits to build a new residence hall with at least 500 beds and to "increase by 200 the number of permanent graduate beds by converting existing beds and/or establishing new beds on MIT's campus or properties owned by MIT" before the end

However, GSAN responded in a statement on its website that the administration didn't completely fulfill the interim report's estimated demand of 1,000-1,100 beds. "Based on the interim report, the percentage of off-campus graduate students expressing a preference to live oncampus doubled between 2014 and today. This underscores the impact of rising rents on students, and suggests that the current shortfall is likely to grow in the years it will takes to bring more units online."

GSAN's statement also raised questions about the specifics of how the administration will create the remaining 200 beds in its current

Gallop said, "The MIT administration and GSAN have the same objective, which is to look carefully at graduate student housing needs. There's just a difference in approach."

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## **Solution to Pumpkin**

5	8	6	9	1	3	2	7	4
4	3	1	7	2	8	6	5	9
9	2	7	9 7 5	4	6	3	8	1
3	7	9	8	5	2	1	4	6
1	5	8	6	9	4	7	2	3
2	6	4	8 6 1	3	7	8	4 2 9	5
6	4	5	2	8	1	9	3	7
7	9	2	2	6	5	4	1	8
8	1	3	4		9	5	6	2

## Solution to Testing

7	2	9	5	4	8	1	3	6
4	8	6	2	1	5	7	9	3
6	1	8	4	3	7	9	2	5
3	7	5	1	9	4	6	8	2
9	4	2	7	6	1	3	5	8
1	5	3	8	7	2	4	6	9
5	9	7	3	2	6	8	1	4
2	6	4	9	8	3	5	7	1
8	3	1	6	5	9	2	4	7



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